

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Discuss the importance and applications of statistical methods in research.
17. A data set consists of the following values: 5, 7, 8, 12, 15, 18, 20. Calculate the arithmetic mean, median, mode, and standard deviation. Discuss the implications of these measures of central tendency and dispersion.
18. A researcher collects data on two variables representing study time (hours per week) and exam scores (out of 100). The data is as follows : (2, 50), (3, 60), (4, 70), (5, 75), (6, 90).
 - (a) Compute the Pearson correlation coefficient.
 - (b) Discuss the relationship observed between study hours and exam scores,
19. Derive the linear regression equation from the following dataset and explain its meaning: (1, 2), (2, 3), (3, 5), (4, 7), (5, 11).
20. Discuss the measures of skewness and kurtosis based on moments. Provide examples of how these measures can be utilized to understand the shape and distribution of data.



APRIL/MAY 2025

**23UEDA12A — MATHEMATICAL
STATISTICS I**

Time : Three hours

Maximum : 75 marks

SECTION A — ($10 \times 2 = 20$ marks)

Answer ALL questions.

1. Define the term statistical method.
2. What is the difference between qualitative and quantitative data?
3. What are the purposes of tabulation in statistics.
4. What is a histogram, and how is it different from a bar chart?
5. How do you calculate the first quartile (Q1) from a data set?
6. What is the arithmetic mean and how is it calculated?
7. Define standard deviation and its significance in data analysis.

8. What does a positive skewness indicate about a data set?
9. What is Pearson's correlation?
10. What is the primary objective of simple regression analysis.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Explain the classification of data with examples.

Or

- (b) Discuss the limitations of statistical methods in data analysis.

12. (a) Describe the properties of the median and how it is calculated.

Or

- (b) Explain the differences between the geometric mean and the harmonic mean.



13. (a) Calculate the range and quartile deviation for the following data set: 12, 15, 20, 22, 25, 30, 35.

Or

- (b) Discuss the importance of mean deviation in understanding data dispersion.

14. (a) Explain Karl Pearson's coefficient of skewness and how it is computed.

Or

- (b) Define kurtosis and describe its significance in statistical analysis.

15. (a) Given the following data, calculate the Spearman's rank correlation coefficient:

X: 10 20 30 40 50

Y: 15 25 35 45 55

Or

- (b) Discuss the assumptions made in regression analysis.